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ABSTRACT

Experiences relating to industry and opportunities to understand contemporary society are a necessary part of the total development and learning common to all students at all educational levels; hence, career education must be a part of the total school curriculum. The industrial arts program plays a major role in helping students achieve the goals of career education by furnishing opportunities for exploring all facets of industry and their interrelationships. Since occupational information is best assimilated and most meaningful when it is an integral part of the total instructional program, industrial arts at each instructional level must offer content and organization that is articulated consistently with other educational levels and other parts of the total curriculum. Variety in available tools, materials, processes, and products is also an important characteristic of the industrial arts program. Suggested guidelines for selecting topics that can be integrated into the classroom and a student occupational preparation checklist are appended. (Author/SB)

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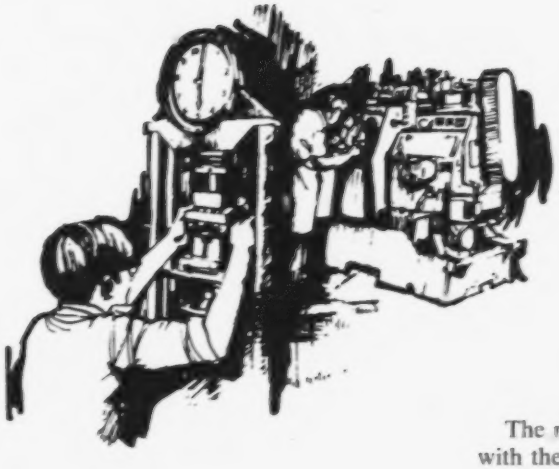

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Preface

Anyone who is aware of the thousands of different occupations in existence in the United States today realizes that the scope of career education is vast—far too broad, certainly, to be confined totally to the field of industrial arts. Within education, therefore, responsibility for career orientation does not rest solely with this segment of the total curriculum.

It must be remembered, however, that occupations in industry and the related services constitute one of the most important areas of the work force, in terms of numbers of people employed. For this reason, and because one of its main objectives is to provide students with general as well as specialized experiences and information about career opportunities in industry, the industrial arts curriculum has a direct and significant relation to career education as a whole.

The broad philosophy and program of industrial arts, which is concerned with all elements of industry, provide an excellent opportunity for students to acquire knowledge about many occupations and professions by the very nature of its instructional content, techniques, and methods. Career orientation is a natural part of industrial arts instruction when occupational information is meaningfully correlated with activities and learning experiences in the elementary, secondary, and postsecondary school programs.

The industrial arts program, by its breadth, flexibility and adaptability, offers an opportune educational environment for much occupational guidance, and at the same time bears the heavy responsibility of actively teaching concepts related to careers. The occupational-orientation aspects of industrial arts should equip students to fulfill important prerequisites for vocational success.

Continuing misinterpretations of the role of industrial arts in vocational education have created a need for clarification of this role. This publication will attempt to carry out such a clarification by defining the role of industrial arts in career education.

Introduction

Industry and its technology continue to have an overwhelming impact on society and on the educational programs that must serve it. A society like ours, in which individuals are expected to enter the labor force and produce the goods and services needed, can no longer tolerate an educational system that largely ignores the world of work if it intends to accept its responsibilities to space-age youth. Since a person's work role does not limit his participation in society, but provides a foundation upon which to build his life, comprehensive career education is a fundamental necessity for all who aspire to a productive, contributing, and satisfying role in this technically-oriented culture.

It is essential to clarify the meaning of certain terms as used in this publication before proceeding to explain the role of industrial arts in the broad scope of career education.

CAREER EDUCATION provides for a broad approach to preparation for citizenship; provides job information and skill development; and also helps individuals develop attitudes about the personal, psychological, social and economic significance of work in our society. It develops and fosters vocational and recreational interests of individuals to help prepare for a well-rounded life in a world in which leisure time is increasing and greater opportunity for self-expression through creative production is available.[1]

OCCUPATIONAL EDUCATION is the process and program of preparing, retraining, or upgrading persons for employment.[2]

INDUSTRIAL ARTS EDUCATION is an area of education that involves the preparation, growth, and guidance of the individual for modern living through individual or cooperative group experiences in working with industrial materials, tools, and processes and studying their social and economic significance to the individual and

[1] As prepared by the U.S. Office of Education, July 29, 1971.

[2] *Vocational-Technical Terminology* (Washington, D.C.: American Vocational Association, 1971), p. 47.

the nation. It involves a program of instruction organized to develop an understanding of the technical, consumer, occupational, recreational, organizational, social, historical, and cultural aspects of industry and technology. Learning experiences include activities such as experimenting, designing, constructing, evaluating, and using tools, materials, and processes which provide opportunities for creativity and problem solving.[3]

Industrial Arts Within Career Education

Experiences relating to industry and opportunities for better understanding of contemporary society are part of the total development and learning process common to each student. Industrial arts is not, of course, the only portion of the total school program concerned with career orientation; however, it plays an important role in providing students with occupational information and knowledge as a basis for making realistic and satisfying career selections. Furthermore, industrial arts can bring about wholesome changes in the learner's habits, attitudes, and understandings, and can help to develop his interest in the man-made physical world, through: (1) a knowledge of how materials are processed and fabricated; (2) an understanding of the interrelationship of the tools, machines, materials and man in industrial processes; (3) evaluation of the learner's attitude toward self, craftsmanship and work; (4) the utilization of such work for health, recreation, and economic purposes; and, (5) the development of a favorable attitude toward creative thinking.

Clear, realistic goals are essential to a sound program of industrial arts. The following six statements are the goals for industrial arts:[4]

1. Develop in each student an insight and understanding of industry and its place in our culture.

[3] *Ibid.*, pp. 36-37.

[4] As prepared for the U.S. Department of Health, Education, and Welfare, Office of Education by the Ad Hoc Committee on Criteria and Guidelines for Funding Industrial Arts, November 1971.

2. Discover and develop talents, aptitudes, interests and individual potential related to the industrial-technical field.
3. Develop skills in the proper use of tools, machines and processes.
4. Develop problem-solving and creative abilities involving the materials, processes, and products of industry.
5. Provide students with an opportunity to make relevant all of their school subjects.
6. Develop an understanding of career opportunities and requirements in industry and develop those traits that will help students obtain and maintain employment.

The unity of purpose between these goals and those of career education (as described in our introduction) is clear. A student who, within his industrial arts program, has benefited from the aims listed above is already on the way to obtaining a well-rounded and well-oriented career education.

Career education must be implemented on a schoolwide basis; this can be done through a guidance team which includes counselors, administrators, and teachers in all disciplines and subject areas. Industrial arts teachers must be recognized members of such a team. Each member should have a function in the total program, derived from his or her individual area of specialization, and a responsibility to cooperate with the others to assist every student in search of the information and knowledge required for a realistic career selection. Such a team should also consider it part of its function to see that career education is made a systematic and sequential developmental process and an integral part of the total instructional program.

The Scope of Career Education in Industrial Arts

Occupational choices are made through a developmental process that evolves through a series of experiences over a number of years. As a student advances from early childhood to adolescence, vocational selections should become more

realistic. The progression constitutes a normal part of adjustment from infant dependency to adult independence.

Activity-oriented industrial arts, through its commitment to student involvement, provides a natural basis for the assimilation and integration of facts, principles and concepts related to career education for all students of all ability levels at each phase of development.

Career education, it must be emphasized, is only one responsibility of a comprehensive industrial arts program, the broad objectives of which must not be sacrificed in favor of any single purpose or function. However, it would seem that teachers and administrators could improve the presentation of, and emphasis on, the occupational-information aspect of the curriculum without endangering the total scope of the industrial arts program.

Career Education at the Elementary Level

Success in the world of work is largely dependent upon such attitudes as the desire to work, dependability, adaptability, loyalty, cooperation, ability to accept responsibility, respect for the dignity of all kinds of work, pride in accomplishment, and appreciation of quality workmanship. Development of such attitudes must

begin at an early age, when the natural curiosity of children generates many questions about work and different occupations.

A question such as "What do parents do?" might provide an opportunity to invite some parents to class in work uniforms to explain their work roles. It could also lead to meaningful role-playing and assist in the conservation of materials, resources, and equipment.

Field trips to construction sites, farms, manufacturing companies, sanitation departments, bakeries, fire departments, television or radio stations, food processing companies, or newspaper offices provide opportunities for firsthand observation of the world of work. These experiences should stimulate the development of related activities by both teachers and students.

Role-playing can be a valuable teaching and learning tool for children at the elementary level. As an introduction to the field of distribution, for example, students can act out such roles as those of purchasing agent, truck driver, dispatcher, inspector, or other real jobs dependent on skills which relate to the industrial technologies.

It is important to provide whatever experiences a child needs to make learning relevant through continuing examination of how man uses work for self-support and self-respect, how job tasks are accomplished, how productivity is related to a variety of abilities, where the jobs are, and who works in these occupations. For example, while publishing a newspaper in class from UPI Teletype, students discover the problem of reporting is not "What shall I print?" but "What shall I eliminate from all the information?" The rewrite girl isn't just learning to type. She is learning to get out a publication and discovering the importance of knowing how to type.

A variety of "hands-on" activities related to the world of work and integrated into the total curriculum as a continuous part of each child's schooling develops an awareness of the technological environment in which the students must live and participate. A technical phase and an academic aspect of education often combine to form the basis of an activity—practicing spelling by using a student-made

telegrapher's key, for example. Introduction to the basic concepts of work, the kinds and values of materials, and the organization and operation of industry is a major objective at this level, as is the discovery of individual abilities, interests, and aptitudes related to the work world.

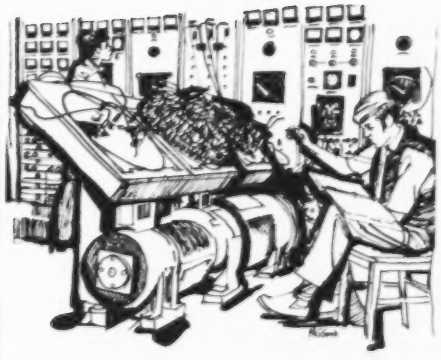
Career Education at the Junior High or Middle School Level

The junior high school industrial arts program is an ideal setting for educational, social, and vocational information related to many of the industrial and technical occupational fields. A growing curiosity on the part of the student about self and environment can lead to a more accurate appraisal of abilities, skills and interests, although it is still too early for most students to make a realistic vocational selection. The student becomes aware that economic independence depends upon acquiring adequate knowledge and skills to fulfill entry-level requirements of a selected career. This recognition provides an opportunity for indirect and subtle development of those abilities and attitudes necessary to succeed in the industrial-technical complex.

The major goals at the junior high school level with respect to career education include the following:

1. Providing experiences for students to assist in evaluating personal interests, abilities, values and needs related to career roles
2. Providing students with opportunities for further and more detailed exploration of selected occupational clusters, leading to the tentative selection of a particular cluster for in-depth exploration at the ninth-grade level
3. Providing practical, tactile, simulated work activities with materials and tools
4. Improving student performance in basic subject areas by unifying the subject matter and focusing it around a cluster development theme, thus giving it more meaning for the student.

Instructional content and activities should be organized to include exposure



experiences in occupations directly related to manipulating operations and experiments with tools, materials, processes, products and functions normally associated with industrial arts. A student completing a unit in construction, for instance, should have a conceptual understanding of the role of the city planner, architect, foreman, carpenter, sheet metal worker, plumber, electrician, and code inspector. Student-centered activities related to career orientation in the industrial technologies such as land, aerospace, pipeline and water transportation or printing, photographic reproduction, commercial art, laser, satellite, T.V., radio, data or telephone in communications or the research design, production and distribution of a product in manufacturing will capitalize upon the uninhibited eagerness and enthusiasm of students at this age.

Within an activity-oriented environment such as the junior high school level industrial arts program, the student can more realistically assess personal potential for success in a variety of vocational fields through practical experiences with the tools, materials, and jobs of industry. Information pertinent to selecting a career, planning a continuing education program, and formulating career goals should be provided by the industrial arts teacher as well as other qualified members of the

staff and community. The industrial arts teacher is often in a position to offer realistic, current occupational information concerning a broad range of industrial and technical vocations as a result of his own personal experience and education.

Career Education at the Secondary Level

Activities may become more formalized, and more specifically related to a central theme of career orientation, in grades nine through twelve. Through study and experiences involving a variety of tools, machines, instruments, materials, and processes, students have the opportunity to plan, experiment and work in the areas relating to many of the industrial-technical fields, and to participate in a series of activities designed to explore typical work clusters from the level of a semiskilled operator to that of a semiprofessional or professional technician, designer, manager, or engineer. These experiences should assist students in assessing their own interests, abilities, limitations and potentials with respect to industrial-technical vocations and the skills, preparation and job demands of a cluster of these occupations. Every family of occupations, whether in the manufacturing or service fields of the industrial complex, offers a continuum which is dependent upon the individual's ability, training, personal drive and ambition.

The increased maturity of the senior high school student should encourage correlation and evaluation of previous orientation experiences, and activities related to occupations and identification with certain occupation clusters should be more realistic. The attitudes which were instilled and developed in students at an earlier age as being important for the world of work should, at the secondary level, be solidified and applied toward a more specific goal. At the same time, most students should receive more formal information about occupations; e.g., job entry levels, job openings, salaries and other benefits, educational requirements, opportunities for advancement, and job interview and application procedures. Historical summaries of our economy and the world of work, key reference sources for vocational information, personal planning, part-time employment, and work experience can also be included in the latter stages of the program.

The range of methods or techniques by which occupational information can be introduced is as extensive as the ingenuity of the teacher himself. The following suggestions should be considered only a sample selection of possibilities:

1. Opportunities could be provided for students to establish simulated manufacturing or service businesses to produce an item or provide a service. The simulated activities would involve market analyzing, corporate organization, union contracts, job structures, product design, advertising, and sales—for a full range of experiences in all phases of a selected business.
2. Mass production activities could be undertaken, involving a cluster of vocational activities focused primarily on the semiskilled, skilled and technical areas. Students could manufacture products for use within the school system; for example, lecterns for classroom teachers, binding of a select number of school annuals, child-care center furniture, or learning aids.
3. Community service projects in cooperation with community agencies or leaders could provide a vehicle for career orientation and real work experiences. Students might, for example, participate in a citywide beautification or ecology project by printing posters, undertaking cleanup projects, or organizing a recycling campaign.
4. Opportunities should be afforded each student for firsthand observation of professionals carrying out the responsibilities of the job under consideration as a possible career choice. Observation of this type assists students in understanding the requirements of the specific vocation, gathering information vital to the pursuit of an identified career, and adjusting to the adult world.
5. An independent study program should be set up to allow maximum flexibility for individual students to increase skill, knowledge and understanding in relation to the segment of the industrial community that interests them most. The teacher should serve as a catalyst whose obligation

is to assist the student in identifying goals, developing a meaningful sequence of experiences, and evaluating the results.

Summary and Conclusion

Experiences relating to industry and opportunities to understand contemporary society are a necessary part of the total development and learning common to all students at all levels of education; hence, career education must be a part of the total school curriculum. Although not the only area of the curriculum responsible for helping students attain the goals of career education, the industrial arts program plays a major role as it furnishes opportunities for students to explore all facets of industry and their interrelationships. Its commitment to the specific undertaking of vocational preparation for its students carries with it a natural vehicle for their career education, their understanding and appreciation of the value of work and of leisure in society as a whole. The "hands-on" approach to industrial concepts provided by industrial arts is therefore an important one.

Since occupational information is best assimilated and most meaningful when it is an integral part of the total instructional program, industrial arts at each instructional level must offer content and organization that is articulated consistently with the other educational levels and with other parts of the total curriculum. Variety in available tools, materials, processes, and products is also an important characteristic of the industrial arts program in its career-orientation aspects. Suggested guidelines for selecting topics and material that can be integrated into classroom activities are included in Appendix A.

Through such a systematic and sequential development of course material, the student's explorations, experiments, projects, discoveries, and problem-solving situations will encourage individual progression toward the ultimate selection of a realistic and satisfying career.

Appendices

The following guidelines are offered as a basis for selecting topics that can be integrated into classroom activities. Appendix A contains general considerations which are basic to any occupational preparation program. The realm of personal assessment by the student, equally a part of career orientation, is represented by the student occupational preparation check list in Appendix B.

Appendix A
Suggested Content Topics

1. Social Significance
   a. How does the occupation under discussion serve society?
   b. What is the growth rate of the industry upon which the position is dependent in relation to the general growth rate of industries in the United States?
   c. How essential is the particular position to the industry as a whole?
   d. What is the projected future of the particular job? Is it subject to rapid change, obsolescence, etc.?
   e. What is the number of persons employed in the occupation in the United States? in the state? in the local region?
   f. Are these numbers increasing or decreasing?
   g. What is the distribution of workers in this type of job throughout the United States?
2. Nature of Work
   a. What, exactly, does the worker in this job do?
   b. Is the work chiefly manual or mental, or both?
   c. Is the work repetitive or varied?
   d. Is the work stimulating in that new problems are continually appearing?
   e. What is the line of authority relating the job to management?
3. Working Conditions
   a. Under what physical conditions are the duties of the job performed?
   b. What are the general sanitary conditions?
   c. What are the working hours?
   d. Is the job done independently or with others?
   e. What are the special safety hazards involved?
   f. What is the social status of fellow workers?
   g. To what organization or association would one in this position be required or expected to belong?

h. What are the opportunities for vacations and recreation?
i. What are the travel or location restrictions or requirements for the job?

4. Qualifications for Entry and Success
   a. What physical characteristics are necessary to perform the duties of the job adequately?
   b. What degree of intelligence and emotional stability is required in order to function completely?
   c. What specific personality traits are desirable for successful performance of the required duties?
   d. What special aptitudes or abilities are required or desired?

5. Preparation Needed
   a. What general education is necessary or desirable?
   b. What special training or skills are necessary or desirable?
   c. What are the experience requirements for entry into this position?
   d. What special apprenticeship or union regulations and requirements must be met?
   e. What postsecondary education requirements are essential?
   f. What on-the-job training is provided?
   g. What is the period of instruction on the job?
   h. From what occupations could one transfer?
   i. What courses in high school would be particularly useful for this position?
   j. What extracurricular activities would be most helpful in preparation for the job?

6. How to Get Started
   a. What are the application procedures for the position?
   b. What special tests, certificates, licenses or other forms are necessary to complete application?
   c. To what department or through what agency must one apply for the position?

7. Opportunities for Advancement
   a. What are the criteria for promotion (seniority, ability)?
   b. What special performance, skills, or personal characteristics are necessary for advancement?
   c. What is the ultimate peak of authority and position to which the job can lead?
   d. What are the related occupations to which the job might lead?
   e. What are the established procedures for seeking advancement within the company?
   f. What are the opportunities for advancement?
8. Remuneration
   a. What is the beginning wage range for the job?
   b. What is the wage range of the greatest number of workers now in a similar position?
   c. What is the maximum wage received by the most highly skilled or competent people in a similar position?
   d. What is the projected peak salary to which the job may lead within the industry?
   e. How does the present annual salary compare with projected life earnings?
   f. What special regulations on salary are imposed within the particular industry or company?
   g. What particular financial benefits are offered by the company or in the particular job (profit-sharing programs, expense account, retirement, paid vacations, sick days, hospitalization benefits, medical services or expenses)?
9. What are the rewards of the job (financial benefits, interesting work, location, social contacts)?
10. What are the negative aspects of the job?
11. Related Occupations

a. What occupations are similar with respect to the nature of the work?
b. What occupations are similar with respect to working conditions?
c. What occupations are similar to this one with respect to qualifications necessary to enter and succeed?
d. In what other occupations could one use the training received for this position?
e. What other occupations require training or preparation similar to, but not as intensive as, that required for this position?

Appendix B
Questions To Be Included on a Student Occupational Preparation Check List

1. What current interests of yours might have some bearing on a final career decision?
2. What are your present occupational goals?
3. What are your personal and social goals?
4. What are your most valuable assets?
   a. Do you have any exceptional skills?
   b. Have you had any special training of any type?
   c. Do you have any special qualifications that would affect an occupational decision?
5. How well do you take directions?
6. How well do you perform under pressure?
7. Do you have any physical limitations?
8. What special research have you done on career opportunities?
9. Are you considering training or education beyond high school?
10. What are your current academic deficiencies?
11. What courses should be taken to strengthen these points?
12. What are the areas of greatest academic strength?
13. What aptitude tests have you taken to assist in making a career decision?

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